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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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WASHINGTON, DC 20005				
EXAMINER				
TUCKER, WESLEY J				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/957,032

Applicant(s)

SHIMIZU, MASAYOSHI

Examiner

WESLEY TUCKER

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 14, 15, 17-19, 32-36 and 38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 14, 15, 17-19, 32-36 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 31st 2008 has been entered.

Response to Amendment

2. Applicant's amendment filed March 31st has been entered and made of record.

3. Applicant has no amended any claims. New claim 38 has been added. Claims 2-13, 16, 20-24, 27-31 and 37 have been withdrawn or cancelled. Claims 1, 14, 15, 17-19 and 32-36 and 38 remain pending.

4. Applicant's arguments in view of the presented claims have been fully considered but are not found persuasive for at least the following reasons:

Applicant attempts to distinguish the present invention from the reference to Fuss by pointing to figure 6 of the specification where non-uniform areas are shown as being divided according to tone information. Applicant contrasts this to Fuss who illustrates that the image is divided into uniform sub-images in Fig. 4. However it should be noted

that Applicant does not mention that non-uniform areas are divided or created anywhere in the claim language. It should also be noted that the goal of Fuss is to enhance both global and local contrast and to do so according to local and global image tone information (column 6, lines 55-67). Fuss also teaches that the divided sub-images are "not necessarily identical in size or ordered in any fashion, and histograms from each local area are derived" (column 6, lines 58-61). One of ordinary skill in the art would understand that the most effective sub-image division for Fuss would be according to content so that each sub-image may have its contrast enhanced according to content. However the new reference to Nakai et al. is cited to teach dividing an image into sub-images according to tone or color data so that the sub-image may be enhanced separately (column 5, lines 50-61 and column 6, lines 46-58). It would have been obvious to one of ordinary skill in the art to divide an image into sub-images according to content tone/color data as taught by Nakai to better enhance the individual sub-images in the image contrast enhancement taught by Fuss.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 14, 17-18, 32-33 and 35-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,581,370 to Fuss et al. and 5,539,523 to Nakai et al.

With regard to claim 1, Fuss discloses an image tone level estimating method for estimating a tone level of an image, comprising:

Dividing an original image into a plurality of image sub-areas according to tone level information (column 6, lines 57-67);

Computing a characteristic amount for each of the plurality of sub-areas producing characteristic amounts (column 7, lines 34-65); and

Computing a statistic amount for estimation of the tone color value level of a whole of the original image using the characteristic amounts for each of the plurality of sub-areas (column 8, lines 20-30).

Fuss discloses dividing an image into smaller sub-images and calculating histograms for each of the smaller histograms. The histograms themselves are interpreted as characteristic amounts for each of the sub-areas. Fuss also discloses that a variance is calculated for each histogram. Fuss then also calculates a statistic amount for enhancing tone scale or contrast based on all of the histograms. The luminance values used by Fuss are interpreted as tone level information. In one particular embodiment, Fuss discloses that all of the histograms are combined as a weighted sum to create a global relevant histogram taking into account the histograms that are most relevant according to their variance compared with a global variance

value. Both the global histogram and the global variance determined for the weighted combination of histograms are considered statistic amounts.

The goal of Fuss is to enhance both global and local contrast and to do so according to local and global image tone information (column 6, lines 55-67). Fuss also teaches that the divided sub-images are "not necessarily identical in size or ordered in any fashion, and histograms from each local area are derived" (column 6, lines 58-61). One of ordinary skill in the art would understand that the most effective sub-image division for Fuss would be according to content so that each sub-image may have its contrast enhanced according to content. Nakai et al. is cited to teach dividing an image into sub-images according to tone or color data so that the sub-image may be enhanced separately (column 5, lines 50-61 and column 6, lines 46-58). It would have been obvious to one of ordinary skill in the art to divide an image into sub-images according to content tone/color data as taught by Nakai to better enhance the individual sub-images in the image contrast enhancement taught by Fuss.

With regard to claim 14, the discussion of claim 1 applies. Fuss discloses the steps of claim 1 repeated in claim 14 as well as the final step of:

comparing the statistic amount with a predetermined value (column 10, lines 44-67). Fuss discloses that the global histogram calculated from the relevant histograms or the weighted sum of histograms of the sub-areas is used to determine the global histogram statistical value and that value is compared to a threshold.

Fuss further discloses determining a correcting parameter based on the comparison result; and correcting the original image using the correcting parameter (column 10, lines 44-67). According to the comparison to the threshold mentioned above the histogram is adjusted in a certain way. For example the threshold of 50 is used to determine whether the variance is low, high or moderate. Then the compensation of the histogram is determined, which is mapped to the output.

With regard to claim 17, the discussions of claims 1 and 14 above apply. Fuss discloses an apparatus for performing the steps discussed above (column 11, lines 7-13).

With regard to claim 18, Fuss discloses the apparatus according to claim 17, further comprising a weight coefficient for each area, wherein said statistic amount computation unit computes the statistic amount using the characteristic amount for each area and the weight coefficient for each area (column 8, lines 20-27).

With regard to claim 32, the discussion of claim 1 applies. Fuss discloses a computer readable medium (column 11, lines 7-13).

With regard to claim 33, the discussion of claim 14 applies.

With regard to claims 35, 36 and 37, the discussions of claims 1 and 14 apply.

With regard to claim 38, the discussion of claim 1 applies. Nakai discloses wherein said dividing divides an original image into a plurality of sub-images according to areas of certain tone ranges (column 5, lines 50-61 and column 6, lines 46-58). Nakai divides images into sub-images according to certain colors which are interpreted as tone ranges.

6. Claims 15, 19 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,581,370 to Fuss and 5,539,523 to Nakai et al. and further in view of Katajamaki et al. ("Image Dependent Gamma Selection Based on Color Palette Equalization and a Simple Lightness Model"). The arguments as to the relevance of Fuss as applied above are incorporated herein.

With regard to claim 15, Fuss discloses using a correcting parameter to generate a corrected image. Fuss further discloses determining a correcting parameter by comparing a computed statistic amount with a predetermined value. Fuss fails to expressly disclose correcting the original image using a plurality of different correcting parameters to generate a plurality of corrected images. It follows that Fuss also fails to expressly disclose determining that the correction result is the corrected image obtained using the correcting parameter corresponding to the statistic amount closest to a predetermined value.

Katajamaki, on the other hand, discloses generating a plurality of corrected images by correcting an original image using a plurality of different correcting parameters (Katajamaki pg. 303: The reference describes using different values of a variable 'f' (i.e. a plurality of different correcting parameters) to generate a plurality of corrected images from an original image).

Katajamaki further discloses defining a corrected image obtained using a correcting parameter (in this case the optimal value (or correcting parameter) was 12) corresponding to a statistic amount closest to a predetermined value among the computed statistic amounts as an appropriate corrected image (Katajamaki pg. 303: again, the reference describes determining the parameter which produces the optimum result (i.e. defining a corrected image) by minimizing a root mean square error value (i.e. the computed statistic amount which was closest to a predetermined value for the statistic amount).).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Fuss' image correcting method by generating a plural corrected images from plural correcting parameters and then determining the appropriate parameter and corresponding image by minimizing some predetermined error index as taught by Katajamaki. Such a modification would have allowed for an iterative image correction algorithm well suited for computer processing. It also would have allowed for the option of using a reference image in the image correction process as an ideal image with which corrected images could be compared to.

With regard to claim 19, Fuss discloses an apparatus for performing the method of claim 15 (see Fuss column 11, lines 7-13).

With regard to claims 34, a computer-readable recording medium that stores a program which causes the computer to execute the steps of claims 1 and 14 is essential if the image processing method disclosed in Fuss is to function (see column 11, lines 7-13).

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WESLEY TUCKER whose telephone number is (571)272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wes Tucker/
Examiner, Art Unit 2624